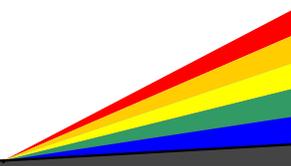


APS COLLOQUIUM SERIES



SPEAKER: **Margaret Murnane**
University of Colorado, Boulder

Prof. Murnane is a professor of physics at the University of Colorado and is a Fellow of JILA, an interdisciplinary research group composed of scientists from the University of Colorado and the National Institute of Standards and Technology. She received a B.S. (1981) and M.S. (1983) from University College in Cork, Ireland, and a Ph. D. (1989) from the University of California, Berkeley. Murnane has held faculty positions at Washington State University (1990-1995) and the University of Michigan (1996-1999). She received two awards from the American Physical Society: the Simon Ramo Award (1990) and the Maria Goeppart-Mayer Award (1997). She was selected as a Presidential Young Investigator (1991) and Presidential Faculty Fellow (1993) by the National Science Foundation. In 1998, she was named a Fellow of the Optical Society of America. She is currently a John D. and Catherine T. MacArthur Fellow and Loeb Lecturer, Harvard University.

TITLE: **Shaped Pulse Optimization of Ultrafast X-ray Generation**

During the past decade, there has been a revolution in the field of ultrafast science. Visible light pulses of only a few optical cycles in duration can now be generated from a simple laser, and their shape in time can be manipulated using new optical waveform generators. Using adaptive feedback control algorithms, we can teach a laser to generate an optimally shaped waveform to enhance a quantum process. This allows us for example to control the response of an atom to light by shaping the wavefunction of the radiating electron. Feedback control of quantum systems can selectively channel laser energy into a specific x-ray wavelength [1,2], or selectively excite or suppress particular vibrations in molecules. Use of ultrafast soft-x-ray pulses to directly observe surface chemistry will also be discussed.

[1] Nature 406, 164-166, 2000.

[2] Physics Today, Search and Discovery, September 2000.

DATE: Wednesday, April 4, 2001

TIME: 11:00 a.m.

LOCATION: 402 Auditorium

Refreshments will be served at 10:45 a.m.